King Fahd University of Petroleum and Minerals

Electrical Engineering Department — *EE 208: Electrical Systems*

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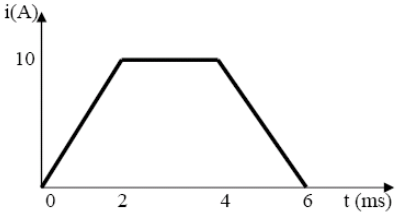
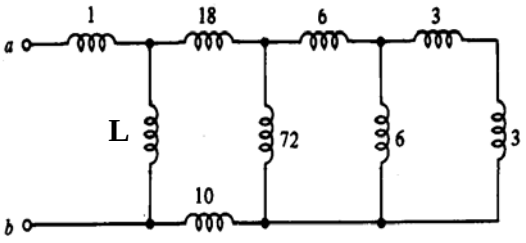
Home Work # 4

1. The current through a 5-mH inductor is shown below. **Determine the voltage** across the inductor at t=1, 3, and 5ms.

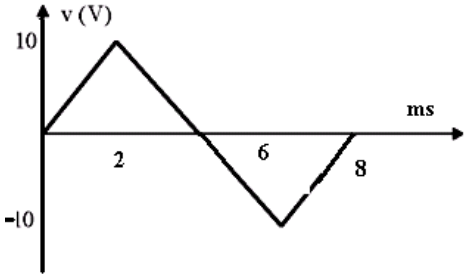


2. Determine the current through a 20-μF capacitor, knowing that it has an energy given by $W(t) = 10\cos^2(377t)\ J$.

3. Find the **value of L,** if the equivalent inductance at terminals a & b is 6H.



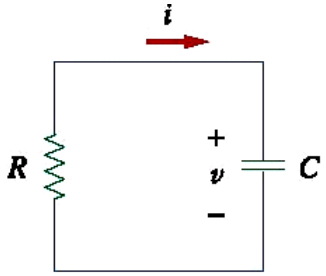
4. The voltage across a 4-μF capacitor is shown below. **Find it's current**.



5. **Find the values of *R* and *C*** in the circuit shown below knowing the voltage and the current are given by:

$v(t) = 56e^{-200t}\text{V},\ t > 0$

$i(t) = 8e^{-200t}\text{mA},\ t > 0$



6. **Find** $V_s(t)$ knowing that the current through the inductor in the circuit below is given by:

$$i_L = \begin{cases} 0 & t < -1 \ \ \& \ \ t \geq 1 \\ 1 - t^2 & -1 \leq t < 1 \end{cases}$$